9. The name and address of the mineral owner of land affected by the revision:

See Volume I and II Application for Permit Amendment - January 1988, Sections 2.2, Exhibit 2-4, and Appendix A.

10. An instrument of consultation with the surface owner as required by SDCL 45-6B-12 and proof of consultation with adjacent landowners as required by SDCL 45-6B-44 for the land affected by the revision:

Delivered to DWNR March 15, 1988.

11. Proof of consultation with the Department of Game, Fish and Parks and the local conservation district, including any additional surveys and requirements considered necessary by those agencies:

See attached copy of letter addressed to Department of Game, Fish and Parks, and a copy of earlier letter dated October 5, 1988 from the Conservation District.

12. Proof of compliance with all county or city zoning ordinances and requirements or proof that the revision is in substantial compliance with the procedure for obtaining any necessary county or city permits:

See attached copy of earlier letter dated August 10, 1988 from Lawrence County.

13. A postmining reclamation map as required by SDCL 45-6B-7(8):

See Brohm's Permit Amendment Application - Exhibit 2-6.

14. The effect the revision has on the timetable and duration of the mining operation:

There will be no effect on the timetable or duration of the mining operation as a result of these revisions. It will allow, however, for the expedited off-loading of spent ore from the heap leach pad.

15. Baseline data and maps pursuant to the requirements of ARSD 74:29:03:07:

Applicant: Brohm Mining Corp.

Date of Technical Revision Request: March 16, 1989

Nature of Request: Regarding off-load criteria and the variance for pH, NO2, and TDS.

Date of Approval or Denial: Conditionally Approved April 4, 1989

Conditions:

- 1. Brohm shall obtain the appropriate groundwater discharge permit amendment in accordance with ARSD 74:03:15 and ARSD 74:03:16.
- 2. The disposal area in Ruby Gulch must have a minimum of 2 feet of soil present for attenuation purposes. Only Cell 6 is currently approved to be off-loaded, upon compliance with Condition Number 1 above.
- 3. Based on the current Cell 6 neutralization results and the intensive treatment characterization to be completed on the next heap to be neutralized (Cell 1), specific off-load criteria limits will be determined.



RECER ED

February 28, 1989

Mr. Mike Cepak
Department of Water and Natural Resources
Joe Foss Building, 4th Floor
523 East Capitol Avenue
Pierre, SD 57501

Dear Mike:

Per our telephone conversation Brohm Mining Corp. is requesting a technical revision for the following item:

1. In the event that the pH of the effluent from a neutralized cell cannot be brought down to 6.5 - 8.5 with a reasonable amount of fresh water, Brohm Mining Corp. requests approval to add acid (as an option) to lower the pH of the solution into the specified range. The acid will be added gradually to the neutralization pond. Our ability to meet the specifications for any of the other key parameters will not be affected. Column testing is underway to confirm this.

Attached is the technical revision fact sheet.

If there are any questions or you need additional information call me at 578-2107.

Sincerely,

Brothm Mining Corp.

Pete Goodwin

Personnel/Govt. Affairs

PG/st

Attachment

TECHNICAL REVISION FACT SHEET

Modification of the Neutralization Proceeds

DATE: February 27, 1989

1. The operator's name:

Brohm Mining Corporation

2. The permit number:

Mining/Milling Permit No. 439 is amended.

3. A narrative description of the revision being proposed:

Addition of hydrochloric acid, as an option to lower the pH of the neutralization effluent to within specified ranges. Details are given in the attached letter.

4. The legal description of land affected by the revision:

See Volume I and II Application for Permit Amendment - January 1988.

5. A map in compliance with SDCL 45-6B-10 and ARSD 74:29:02:12, showing the land affected by the revision:

See Volume I and II Application for Parmit Amendment - January 1988. No additional land will be affected.

6. The estimated cost of implementing and completing the reclamation of land affected by the revision:

No land will be affected by this revision.

7. A description of the reclamation being proposed for the land affected by the revision:

Since no land is affected by this technical revision no modifications to the current reclamation plan is necessary.

8. The name and address of the surface owner of land affected by the revision:

See Volume I and II Application for Fermit Amendment - January 1988.

(tr0289A) (022789)

9. The name and address of the mineral owner of land affected by the revision:

See Volume I and II Application for Permit Amendment's January 1988.

10. An instrument of consultation with the surface owner as required by SDCL 45-6B-12 and proof of consultation with adjacent landowners as required by SDCL 45-6B-44 for the land affected by the revision:

Delivered to DWNR March 15, 1988.

11. Proof of consultation with the Department of Game, Fish and Parks and the local conservation district, including any additional surveys and requirements considered necessary by those agencies:

To be submitted directly to DNNR by these agencies.

12. Proof of compliance with all county or city zoning ordinances and requirements or proof that the revision is in substantial compliance with the procedure for obtaining any necessary county or city permits:

Letter from Lawrence County covering revisions of this type previously submitted.

13. A postmining reclamation map as required by SDCL 45-68-7(8):

See Brohm's Permit Amendment Application - Exhibit 2-6.

14. The effect the revision has on the timetable and duration of the mining operation:

There will be no effect on the timetable or duration of the mining operation as a result of these revisions.

15. Baseline data and maps pursuant to the requirements of ARSD 74:29:03:07:

Applicant: Brohm Mining Corp.

Date of Technical Revision Recuest: March 1, 1989

Nature of Request: Addition of acid to lower the pH of

neutralized material

Date of Approval or Denial: Technical Revision request was

cancelled March 15, 1989.

Conditions:



February 20, 1989

Mr. Mike Cepak Department of Water and Natural Resources Joe Foss Building 523 East Capitol Avenue Pierre, SD 57501

RECEIVED

FEB 23 1989

EXPLOSATION AND

Dear Mike:

Per our conversation on February 17, 1989 Brohm Mining Corp. is requesting a technical revision for the following items:

- Permission to install a 10' x 10' building containing a 2,500 gallon plastic tank to contain Nalco 7852 coagulant. The building will be located at the upper end of the Road C This reagent will be metered into the pregnant solution line prior to discharge into the surge pond or the pregnant solution sump. The purpose of this material is to aid in the clarification of the pregnant solution. The material safety data sheet for this reagent is enclosed.
- Permission to install a 10' x 10' building containing a 1,100 gallon plastic tank to contain Nalco 7817 scale control reagent. The building will be located at the northeast corner of the neutralization pond. This reagent will be metered into the neutralization pond to control scale build-up in the neutralization circuit. The material safety data sheet for this reagent is enclosed.
- Permission to remove the existing scale control tank from the preg/barren sump area and replace it with a building and tank similar to the one in item 1 above. The reagent to be used in this area is the Nalco 7817 scale control.

The Technical Revision Fact Sheet containing other pertinent information is enclosed. If there are any questions or you need additional information please call me at 578-2107.

South Dakota Office: P.O. Box 485, Deadwood, South Dakota 57732

Sincerely,

Brohm Mining Corp. Daniel L Blakeman

Dan Blakeman

Process Superintendent

Barry Parrish, SD Dept. of Game, Pish & Parks

Material Safety Data Sheet Enc:

Technical Revision Fact Sheet

RECER LE Modification and Installation of Anti-scalant FEB 23 1989

DATE: February 20, 1989

1. The operator's name:

Brohm Mining Corporation

2. The permit number:

Mining/Milling Permit No. 439 as amended.

- A narrative description of the revision being proposed: 3.
 - 1) Addition of a building and a tank to add coagulant to the pregnant solution from the leach pad.
 - 2) Addition of a building and tank to add anti-scale reagent to the neutralization circuit.
 - 3) Replacement of the existing anti-scale tank at the preg/barren sump with one similar to item 2 above. (Details provided in attached documentation.)
- The legal description of land affected by the revision:

See Volume I and II Application for Permit Amendment -January 1988.

A map in compliance with SDCL 45-6B-10 and ARSD 74:29:02:12, showing the land affected by the revision:

See Volume I and II Application for Permit Amenament -January 1988. No additional land will be affected.

The estimated cost of implementing and completing the 6. reclamation of land affected by the revision:

No land will be affected by this revision.

A description of the reclamation being proposed for the land affected by the revision:

Since no land is affected by this technical revision no modifications to the current reclamation plan is necessary.

The name and address of the surface owner of land affected by the revision:

See Volume I and II Application for Fermit Amendment -January 1988.

9. The name and address of the mineral owner of land affected by the revision:

See Volume I and II Application for Permit Amendment - January 1988.

10. An instrument of consultation with the surface owner as required by SDCL 45-68-12 and proof of consultation with adjacent landowners as required by SDCL 45-68-44 for the land affected by the revision:

Delivered to DWNR March 15, 1988.

11. Proof of consultation with the Department of Game, Fish and Parks and the local conservation district, including any additional surveys and requirements considered necessary by those agencies:

To be submitted directly to DWNR by these agencies.

12. Proof of compliance with all county or city zoning ordinances and requirements or proof that the revision is in substantial compliance with the procedure for obtaining any necessary county or city permits:

Letter from Lawrence County covering revisions of this type previously submitted.

13. A postmining reclamation map as required by SDCL 45-68-7(8):

See Brohm's Permit Amendment Application - Exhibit 2-6.

14. The effect the revision has on the timetable and duration of the mining operation:

There will be no effect on the timetable or duration of the mining operation as a result of these revisions.

15. Baseline data and maps pursuant to the requirements of ARSD 74:29:03:07:

Applicant: Brohm Mining Corp.

Date of Technical Revision Request: February 23, 1989

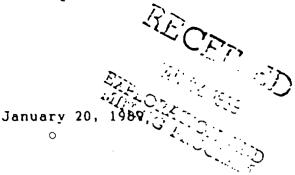
<u>Nature of Request</u>: Coagulant and Anti-Scalent Storage Technical Revision

Date of Approval or Denial: Conditionally Approved March 3, 1989

Conditions:

- 1. Brohm Mining shall install a containment system for each of the buildings. The containment system shall consist of berms constructed around the base of the building, capable of containing the volume of the tank or capable of directing the leakage to another approved containment facility such as the lined trench, the surge pond, or the neutralization pond. The berms and the base of the buildings shall be lined with a minimum of 30 mil PVC, 40 mil HDPE or any other approved liner.
- 2. Brohm Mining shall notify the Department immediately upon scalent or coagulant spillage. This notification shall follow procedures set forth in the spill contingency plan.





Mr. Tom Durkin
Hydrologist
S.D. Dept. of Water and Natural Resources
Joe Foss Building, 4th Floor
523 E. Capitol Avenue
Pierre, SD 57501

1

Dear Tom:

The attached technical revision deals with the revised water quality monitoring program as agreed in the September 13, 1988 meeting at the Gilt Edge site and from your letter of October 8, 1988.

If you have any questions, please call me at 578-2107.

Sincerely,
Brohm Mining Corporation

Shu Willenker

John Wilbanks
Dir. - Environmental Affairs

JW/dv1

enc:

TECHNICAL REVISION

Modification of the Water Quality Sampling Program

DATE: January 20, 1989

1. The operator's name:

Brohm Mining Corporation

)

2. The permit number:

Mining/Milling Permit No. 439 as amended.

3. A narrative description of the revision being proposed:

Brohm proposes to modify the water quality sampling program to accommodate the addition of sampling sites for operational compliance sampling. Analysis parameters are being modified based on data from 1985 to 1988. Some parameters will be deleted and others added to the list. A more detailed explanation is provided in the attached narrative titled Water Quality Monitoring.

4. The legal description of land affected by the revision:

See Volume I and II Application for Permit Amendment - January 1988.

5. A map in compliance with SDCL 45-6B-10 and ARSD 74:29:02:12, showing the land affected by the revision:

See Volume I and II Application for Permit Amendment - January 1988. No additional land will be affected.

6. The estimated cost of implementing and completing the reclamation of land affected by the revision:

No land will be affected by this revision.

7. A description of the reclamation being proposed for the land affected by the revision:

Since no land is affected by this technical revision no modifications to the current reclamation plan is necessary.

8. The name and address of the surface owner of land affected by the revision:

See Volume I and II Application for Permit Amendment - January 1988.

9. The name and address of the mineral owner of land affected by the revision:

See Volume I and II Application for Permit Amendment - January 1988.

10. An instrument of consultation with the surface owner as required by SDCL 45-6B-12 and proof of consultation with adjacent landowners as required by SDCL 45-6B-44 for the land affected by the revision:

Delivered to DWNR March 15, 1988.

11. Proof of consultation with the Department of Game, Fish and Parks and the local conservation district, including any additional surveys and requirements considered necessary by those agencies:

To be submitted directly to DWNR by these agencies when applicable.

12. Proof of compliance with all county or city zoning ordinances and requirements or proof that the revision is in substantial compliance with the procedure for obtaining any necessary county or city permits:

Letter from Lawrence County covering revisions of this type previously submitted.

13. A postmining reclamation map as required by SDCL 45-6B-7 (8):

See Brohm's Permit Amendment Application - Exhibit 2-6.

14. The effect the revision has on the timetable and duration of the mining operation:

There will be no effect on the timetable or duration of the mining operation as a result of these revisions.

15. Baseline data and maps pursuant to the requriements of ARSD 74:29:03:07:

TABLE 1

A) Oxide Groundwater Monitoring Equirements

Monitoring Station	Sampling Frequency	Parameters to be Tested
GW-1 (old)	Quarterly	Short List
GW-2 (new)	Monthly	Full Scite
GW-3 (new)	Monthly .	Full Suite
GW-4 (old)	Quarterly	Short list
GW-5 (old)	Quarterly	Short List
GW-6 (old)	Quarterly	Short list
GW-7 (old)	Quarterly	Short list
GW-8 (new)	Monthly	Full Suite
GW-9 (new)	Monthly	Full Suite
GW-10 (new)	Monthly	Full Suite
GW-11 (old)	Quarterly	Short List
GW-12 (new)	Monthly	Full Suite
Bed-ll (new)	Monthly	Full Suite
Bed-15 (new)	Monthly	Full Suite
Bed-18 (new)	Monthly	Full Suite
Bed-19 (new)	Monthly	Full Suite
Bes-15 (new)	Monthly	Full Suite
Bes-17 (new)	Monthly	Full Suite
DW-1 (new)	Monthly	pH, Conductivity, TDS,
	•	WAD & Free Cn, Na, Au, As
DW-1	Quarterly	Full Suite
DW-2 (new)	Monthly	pH, Conductivity, TDS,
•	-	WAD & Free Co, Na, Au, As
DW-2	Quarterly	Full Suite

B) Oxide Surface Water Monitoring Eequirements

Monitoring Station	Sampling Frequency	Perameters to be Tested
SW-l (old)	Quarterly &	Short List
SW-2 (old)	Quarterly	Short List
SW-3 (old)	Quarterly	Short List
SW-4 (old)	Quarterly	Short List
SW-5 (old)	Quarterly	Short List
SW-6 (old)	Quarterly	Short List
SW-8 (old)	Quarterly	Short List
SW-11 (new)	Bimonthly	Full Suite
SW-28 (new)	Bimonthly	Full Suite
SW-35 (new)	Bimonthly	Full Suite
FD-1 (new)	Monthly	pE, Conductivity, TDS,
_		WAD & Free Cr, Na, Au, As
FD-1	Quarterly	Full Suite

TABLE 2
Water Quality Parameters

	Surface Water	
Full Suite	Short List	Full Suite
Full Suite CaCO3 HCO3 CO3 Cl SO4 Ca Mg Major Anions Major Cations Cation-Anion Balance pH Conductivity Cn-Total & WAD Hardness TDS TSS Turbidity K Na Sb Al As Be B Cd Cr Co Cu Fe Li Mn Hg Ni Se Ag V . Zn NH3 NO2 NO3	PH Conductivity TSS TDS #Cn-Tot/WAD/Free HCO3 SO4 Na As Cd Cu Se Zn NO3 Flow	CaCO3 RCO3 CC1 SO4 Ca Mg Major Anions Major Cations Cat/An Bal pH Conductivity Cn-Tot & WAD Hardness TDS TSS Turbidity K Na Sb Al As Be B Cd Cr Co Cu Fe Li Mn Hg Ni Se Ag V Zn NH3 NO2 NO3
Phosphorus, Total Water Level		N-Total Kjel. Phosphor, Tot Flow
	CaCO3 HCO3 CO3 CO1 SO4 Ca Mg Major Anions Major Cations Cation-Anion Balance pH Conductivity Cn-Total & WAD Hardness TDS TSS Turbidity K Na Sb Al As Be B Cd Cr Co Cu Fe Li Mn Hg Ni Se Ag V Zn NH3 NO2 NO3 N-Total Kjeldahl Phosphorus, Total	Full Suite CaCO3 HCO3 Conductivity CO3 TSS Cl TDS SO4 *Cn-Tot/WAD/Free HCO3 Mg Major Anions Major Cations Cation-Anion Balance PH Cu Conductivity Se Cn-Total & WAD TDS TDS TUrbidity K Na Sb Al As Be B Cd Cr Co Cu Fe Li Mn Hg Ni Se Ag V Zn NH3 NO2 NO3 N-Total Kjeldahl Phosphorus, Total

^{* -} If Total Cn is undetectable, no need to sample WAD or Free Cn.
Free Cn need only be sampled at the following surface water sites located on classified streams: SW-1, -2, -3, -5, -6, -8, and -11 and also at station French Drain 1 (FD-1) pursuant to condition #9 on page 14 of the Brohm Mining Amendment Conditions.

WATER QUALITY MONITORING

As agreed at the September 13, 1988 meeting with Tom Durkin of DWNR, the following is proposed as a modification to the Water Quality Monitoring program at the Gilt Edge site.

The sampling frequency will be conducted with the following schedules based on the regional hydrograph:

Quarterly
mid January
mid April
mid May
late August

Bimonthly
early November
mid January
mid April
mid May
early June
late August

Sites will be sampled for the parameters and frequency as shown on Table 1. The elements as referenced in Table 1 are shown on Table 2.

NOTES: Total and dissolved constituents will be monitored in surface waters. Groundwater wells will be monitored for total and dissolved constituents three times in 1989 (mid January, mid April, and mid May) to complete 1 years worth of quarterly data and to provide correlations with existing and future results. The interim groundwater samples and all future groundwater samples may be analyzed for dissolved constituents only.

Brohm will discontinue stream sampling when neavy ice covers the stream. Both flow data and chemical analysis are not accurate when large amounts of water are tied up in the form of ice.

Applicant: Brown Mining Corp.

Date of Technical Revision Request: January 24, 1989

Nature of Request: Brohm's operational monitoring
requirements (Oxide Project)

Date of Approval or Denial: Conditionally approved January 26, 1989

Conditions:

Surface water quality samples must be taken from ice covered streams in cases where stream water flow below the ice cover is sufficient to obtain a sample. Flow measurements may be omitted when streams are ice covered. (Remember that the water monitoring results submitted to DWNR must indicate which sites were frozen or dry).



RECENT SO

January 16, 1989

Mr. Mike Cepak S.D. Dept. of Water and Natural Resources Joe Foss Building, 4th Floor 523 East Capitol Avenue Pierre, South Dakota 57501

Dear Mike:

Per our telephone conversation, Brohm Mining Corporation is requesting a technical revision for the following item:

Brohm proposes to rent a portable propane fired steam heater to heat neutralizing solution. The unit is totally contained on a trailer and would only be used for a maximum of 3 months. No grading or site preparation is necessary. The only external requirements are for propane lines and electrical hook-up. The BTU rating of the unit at sea level is greater than 4.5 million BTU/hr. However, the BTU rating of the unit at site elevation of 5,450 feet is less than 4.5 million BTU/hr. Therefore, we do not need an air quality permit. I will send you and Keith Gestering copies of the technical information on the portable heater sometime next week (Jan. 23, 1989).

If there are any questions or you need additional information, call me at 578-2107.

Sincerely,

Brohm Mining Corporation

John Wilbanks

Dir. - Environmental Affairs

JW/dv1

cc: Pete Goodwin

Carl Seward

TECHNICAL REVISION

١

Addition of Portable Temporary Heate

DATE: December 14, 1988

1. The operator's name:

Brohm Mining Corporation

The permit number:

Mining/Milling Permit No. 439 as amended.

3. A narrative description of the revision being proposed:

Bring in a temporary (90 days) portable propane fired heater to heat neutralization solution at the neutralization pond.

4. The legal description of land affected by the revision:

See Volume I and II Application for Permit Amendment - January 1988.

5. A map in compliance with SDCL 45-6B-10 and ARSD 74:29:02:12, showing the land affected by the revision:

See Volume I and II Application for Permit Amendment - January 1988. No additional land will be affected.

6. The estimated cost of implementing and completing the reclamation of land affected by the revision:

No additional land will be affected by this revision.

7. A description of the reclamation being proposed for the land affected by the revision:

Since no land is affected by this technical revision no modifications to the current reclamation plan is necessary.

8. The name and address of the surface owner of land affected by the revision:

See Volume I and II Application for Permit Amendment - January 1988.

9. The name and address of the mineral owner of land affected by the revision:

See Volume I and II Application for Permit Amendment - January 1988.

(011789)

10. An instrument of consultation with the surface owner as required by SDCL 45-6B-12 and proof of consultation with adjacent landowners as required by SDCL 45-6B-44 for the land affected by the revision:

١

Delivered to DWNR as part of a permit amendment March 15. 1988.

11. Proof of consultation with the Department of Game, Fish and Parks and the local conservation district, including any additional surveys and requirements considered necessary by those agencies:

See attached exemption letter from Soil Conservation Service. Game, Fish and Parks comments to be submitted directly to DWNR.

12. Proof of compliance with all county or city zoning ordinances and requirements or proof that the revision is in substantial compliance with the procedure for obtaining any necessary county or city permits:

Letter from Lawrence County covering revisions of this type previously submitted to DWNR.

13. A postmining reclamation map as required by SDCL 45-6B-7 (8):

See Brohm's Permit Amendment Application - Exhibit 2-6.

14. The effect the revision has on the timetable and duration of the mining operation:

There will be no effect on the timetable or duration of the mining operation as a result of these revisions.

15. Baseline data and maps pursuant to the requirements of ARSD 74:29:03:07:

Applicant: Brohm Mining Corp.

Date of Technical Revision Request: January 19, 1989

<u>Nature of Request</u>: Temporarily install a portable propane heater to heat neutralizing solution

Date of Approval or Denial: Approved January 26, 1989

Conditions:

BROHM MINING CORP.

September 29, 1988

Mr. Mike Cepak S.D. Dept. of Water & Natural Resources Joe Foss Building 523 East Capitol Ave. Pierre, SD 57501

Dear Mike:

Per our telephone conversation, Brohm is proposing a minor modification to the operation of the leach pad. This modification would involve loading the pad such that the top surface would have ore all the way across instead of cells with a void in between. The leach pad base has berms and perforated drainage pipe to allow for separate collection of pregnant solution and separate return for the neutralizing solution from each of the seven cells. The leak detection and recovery system will remain as is. In the event of a leak, we can isolate the system, determine the location of the leak and repair the primary liner system.

Brohm would maintain a void between cells 6 and 7 so we can comply with and follow the procedure of Heap Neutralization on page 15 of the conditions. After the initial spent ore characterization, these cells would also be loaded across the asphalt curbs. Future monitoring would follow the procedure as outlined in the conditions.

I am attaching a modified description of the leach pad operations which is taken from pages 2-36 of the permit amendment of January 1988. This comparison shows the minor magnitude of this technical revision request.

If there are any questions, call me at 578-2107.

Sincerely,

Brohm Mining Corporation

John Willents

John C. Wilbanks

Dir. - Environmental Affairs

JCW/dv1

enc:

LEACH PAD OPERATIONS

٠:

RECETVEL

Heap Leaching. The proposed heap leaching pro consist of truck hauling crushed agglomerated ore stockpile and loading it on the leach pad and then redistributing the ore by dozer to a depth of approximately 25 feet. The heap will be physically and hydraulically separated bottom by small asphalt berms and perforated drainage the pipe. These berms separate the operation and leak detection of the leach pad into seven individual cells.

part of the pad has been loaded, solution distribution lines are fitted with sprinklers on top of the pile and a leach solution containing 250 to 750 ppm sodium cyanide will be sprayed onto the pile at the rate of 0.004 gpm per square foot. Leaching will continue for approximately seven weeks at which time washing and neutralization will commence. Wash solution will be distributed onto the heap with the existing distribution piping and at the same application rate as leach solutions. Four weeks will be allowed for the washing and neutralization of individual area prior to unloading and disposal. Test work shown that a four week period of washing alternating with drain-down periods followed by another wash period will reduce the weak acid dissociable (WAD) cyanide concentration in the pore water to less than 0.5 mg/L. Hydrogen peroxide will be added to the wash solutions to ensure the WAD cyanide level is The effluent solution from the heap will within specification. be monitored to indicate when washing is complete.

When neutralization is complete, excess moisture will be allowed to drain from the heap prior to off-loading. Off-loading will be accomplished by front end loaders and trucks. The spent ore will then be hauled to the spent ore rock disposal area.

Schedule. The on-off heap leaching process, by its nature, is subject to curtailment during periods of extreme cold and heavy snow. For this reason the normal operating season is expected to be the months of March through November, inclusive. However, if weather permits, operation in the other months may continue using existing technology such as drip irrigation or new technology which may be developed.

Leach operation will be conducted on a 24 hour per day, seven day per week continuous basis. In the winter months it is anticipated that leach solution will be circulated through the heap and process plant even though loading or unloading may not be feasible. Operation on a continuous basis will keep operating levels of process solution in steady state and allow the circulating volumes to be kept to a minimum.

(092988)

TECHNICAL REVISION

Leach Pad Loading Modification.

DATE: September 30, 1988

1. The operator's name:

Brohm Mining Corporation

2. The permit number:

Mining/Milling Permit No. 439 as amended.

3. A narrative description of the revision being proposed:

Narrative description contained in cover letter from John Wilbanks to Mike Cepak dated September 29, 1988.

4. The legal description of land affected by the revision:

See Volume I and II Application for Permit Amendment - January 1988.

5. A map in compliance with SDCL 45-6B-10 and ARSD 74:29:02:12, showing the land affected by the revision:

See Volume I and II Application for Permit Amendment - January 1988. No additional land will be affected.

6. The estimated cost of implementing and completing the reclamation of land affected by the revision:

The estimated cost of reclamation will not increase due to the changes proposed. Land affected by these changes have already been bonded at the maximum levels of disturbance under the current permit.

7. A description of the reclamation being proposed for the land affected by the revision:

These technical revisions will be accommodated under the existing reclamation plan as approved in March 1988. (See Brohm Mining Corporation - Application For Permit Amendment - 1988.)

8. The name and address of the surface owner of land affected by the revision:

See Volume I and II Application for Permit Amendment - January 1988.

(tr2-988) (093088)

9. The name and address of the mineral owner of land affected by the revision:

See Volume I and II Application for Permit Amendment - January 1988.

10. An instrument of consultation with the surface owner as required by SDCL 45-6B-12 and proof of consultation with adjacent landowners as required by SDCL 45-6B-44 for the land affected by the revision:

Delivered to DWNR March 15, 1988.

11. Proof of consultation with the Department of Game, Fish and Parks and the local conservation district, including any additional surveys and requirements considered necessary by those agencies:

To be submitted directly to DWNR by these agencies.

12. Proof of compliance with all county or city zoning ordinances and requirements or proof that the revision is in substantial compliance with the procedure for obtaining any necessary county or city permits:

Letter from Lawrence County covering revisions of this type previously submitted.

13. A postmining reclamation map as required by SDCL 45-6B-7(8):

See Brohm's Permit Amendment Application - Exhibit 2-6.

14. The effect the revision has on the timetable and duration of the mining operation:

There will be no effect on the timetable or duration of the mining operation as a result of these revisions.

15. Baseline data and maps pursuant to the requirements of ARSD 74:29:03:07:

Applicant: Brohm Mining Corp.

Date of Technical Revision Request: October 5, 1988

<u>Nature of Request</u>: Technical revision to modify the loading of the leach pad.

Date of Approval or Denial: Conditionally Approved November 16, 1988

Conditions:

Referring to the conditions placed on the April 21, 1988 Amendment to Mining Permit No. 439, and due to the fact that leaching began with Cells #6 and #7, Condition B-4 under Heap Neutralization shall be revised as follows:

During each seven-cell leaching cycle, one cell shall be subjected to the monitoring required under intensive treatment monitoring, (A-2) above. This monitoring will begin with heap Cell #1 following its second use, #2 after its third use, #3 after its fourth use, and so on. Compliance for off-loading must be demonstrated in accordance with (A-3) above. If these intensive monitoring procedures clearly indicate that the reliability of the operational monitoring schedule or parameters is inadequate, the Department may revise the operational monitoring schedule to correct deficiencies.

- 2. Brohm Mining shall allow adequate buffer between ore undergoing leaching, spent ore undergoing neutralization, and spent ore being off-loaded to prevent mixing of ore under leach, or unneutralized spent ore, with spent ore being off-loaded.
- 3. If a leach pad cell has or develops a leakage rate through the primary liner that, individually, causes an overall pad leakage rate of 300 gallons per acre per day or more (gpad), that cell, for subsequent ore loading, shall be isolated from the rest of the pad by leaving void spaces between the leaking cell and adjacent cells. A cell that has individually caused an overall pad primary liner leakage rate of 300 gpad or more shall continue to be isolated until it is repaired. This does not eliminate the need to comply with the response actions required under the action

leakage rate schedule (i.e. any cell having a leakage rate that causes the overall pad leakage rate to exceed 300 gpad is to be repaired following off-loading).

4. For each individual cell in compliance with approved neutralization standards, a cell shall only be off-loaded to a point on the primary liner as shown on the attached drawing and described as follows:

The toe of the slope of spent ore on the primary liner which has its crest at the point directly above the cell dividing berm.

BROHM MINING CORP.

September 23, 1988

Mr. Mike Cepak
Department of Water and Natural Resources
Joe Foss Building
Pierre, South Dakota 57501

Dear Mike:

Per our telephone conversation Brohm Mining Corporation is requesting technical revisions for the three following Items:

1.) Pond Boot Elimination.

Brohm's original surge and neutralization pond design called for the installation of boots where solution pipes were anchored at the pond bottoms in the attempt to prevent solution leakage. Following extensive testing it was found that this design was prone to failure thus an alternative design eliminating liner penetration was implemented. The new design allows the piping to rest upon a protective pad/slip sheet on top of the pond liners eliminating the need for bottom anchors and boots. New design details are shown on drawings 40-450-02 and 50-410-04.

2.) Liner Vent Elimination.

After further review and design consideration it was determined that liner vents are not necessary due to adequate inter-liner ventilation produced by the leak detection pipes. By eliminating the liner vents the integrity of the primary liner will not be compromised and better leak protection will result. A revised drawing 50-410-04 with the liner vent details removed is enclosed.

3.) Surge Pond Protective Cover Sheet Installation.

To help reduce the phreatic head on the primary liner in the event of a leak Brohm installed a protective cover sheet over the primary liner in the surge pond. This cover sheet will also serve to protect the primary liner from miscellaneous physical damage due to such things as ice povement and pond maintenance activities.

If there are any questions or you need additional information call me at 578-2107

Sincerely,

John Wilbanks

Director of Environmental Affairs

Willenber

enc:

JW/scw

TECHNICAL REVISION

- 1. Pond Boot Elimination.
- 2. Liner Vent Elimination.
- 3. Surge Pond Protective Cover Sheet Installation.

DATE: September 28, 1988

1. The operator's name:

Brohm Mining Corporation

2. The permit number:

Mining/Milling Permit No. 439 as amended.

3. A narrative description of the revision being proposed:

Narrative description contained in cover letter from John Wilbanks to Mike Cepak dated September 23, 1988.

4. The legal description of land affected by the revision:

See Volume I and II Application for Permit Amendment - January 1988.

5. A map in compliance with SDCL 45-6B-10 and ARSD 74:29:02:12, showing the land affected by the revision:

See Volume I and II Application for Permit Amendment - January 1988. Also enclosed are site drawings. No additional land will be affected.

6. The estimated cost of implementing and completing the reclamation of land affected by the revision:

The estimated cost of reclamation will not increase due to the changes proposed. Land affected by these changes have already been bonied at the maximum levels of disturbance under the current permit.

7. A description of the reclamation being proposed for the land affected by the revision:

These technical revisions will be accommodated under the existing reclamation plan as approved in March 1988. (See Brohm Mining Corporation - Application For Fermit Amendment - 1988.)

8. The name and address of the surface owner of land affected by the revision:

See Volume I and II Application for Permit Amendment - January 1988.

9. The name and address of the mineral owner of land affected by the revision:

See Volume I and II Application for Permit Amendment - January 1988.

10. An instrument of consultation with the surface owner as required by SDCL 45-6B-12 and proof of consultation with adjacent landowners as required by SDCL 45-6B-44 for the land affected by the revision:

Delivered to DWNR March 15, 1988.

11. Proof of consultation with the Department of Game, Fish and Parks and the local conservation district, including any additional surveys and requirements considered necessary by those agencies:

To be submitted directly to DWNR by these agencies.

12. Proof of compliance with all county or city zoning ordinances and requirements or proof that the revision is in substantial compliance with the procedure for obtaining any necessary county or city permits:

Letter from Lawrence County attached.

13. A postmining reclamation map as required by SDCL 45-68-7(8):

See Brohm's Permit Amendment Application - Exhibit 2-6.

14. The effect the revision has on the timetable and duration of the mining operation:

There will be no effect on the timetable or duration of the mining operation as a result of these revisions.

15. Baseline data and maps pursuant to the requirements of ARSD 74:29:03:07:

Applicant: Brohm Mining Corporation

Date of Technical Revision Request: September 23, 1988

<u>Nature of Request</u>: To eliminate piping boots in surge pond, eliminate liner vents, and to install a cover sheet in the surge pond.

<u>Date of Approval or Denial</u>: Conditionally approved October 5, 1988

Conditions:

1. The three above-referenced technical revisions shall be noted on the as-built or record drawings.

BROHM MINING CORP.

August 30, 1988 RECEIVED

SED 2 193

LC 110 110 110

Mr. Mike Cepak
Dept. of Water & Natural Resources
Joe Foss Building
523 East Capitol Avenue
Pierre, South Dakota 57501

RE: Petroleum Storage Technical Revision

Dear Mike:

Brohm plans to change the petroleum storage design to comply with the requirements of Aboveground Stationary Storage Tanks (AST) Chapter 74:03:30. The attached letter from Blattner dated August 26, 1988 shows the details of the design. The diesel tank is on skids and the sil tank is a trailer on wheels. We plan to berm the area and provide a 60 Mil EPDE liner.

Please review this revisith for approval and call me at 578-2107 if there are any questions.

Sincerely,

Brohn Mining Corporation

John C. Wilbanks

Dir. - Environmental Affairs

JCW/dv1

enc:

TECHNICAL REVISION

Petroleum Storage

DATE: August 30, 1988

1. The operator's name:

Brohm Mining Corporation

2. The permit number:

Mining/Milling Permit No. 439 as amended.

3. A narrative description of the revision being proposed:

Narrative description contained in letter from Blattner to John Wilbanks dated August 26, 1988.

4. The legal description of land affected by the revision:

See Volume I and II Application for Permit Amendment - January 1988.

5. A map in compliance with SDCL 45-6B-10 and ARSD 74:29:02:12, showing the land affected by the revision:

See Volume I and II Application for Permit Amendment - January 1988. Also enclosed are site drawings.

6. The estimated cost of implementing and completing the reclamation of land affected by the revision:

The estimated cost of reclamation will not increase due to the changes proposed. Land affected by these changes have already been bonded at the maximum levels of disturbance under the current permit.

7. A description of the reclamation being proposed for the land affected by the revision:

These technical revisions will be accommodated under the existing reclamation plan as approved in March 1988. (See Brohm Mining Corporation - Application For Permit Amendment - 1988.)

8. The name and address of the surface owner of land affected by the revision:

See Volume I and II Application for Permit Amendment - January 1988.

9. The name and address of the mineral owner of land affected by the revision:

See Volume I and II Application for Permit Amendment - January 1988.

10. An instrument of consultation with the surface owner as required by SDCL 45-6B-12 and proof of consultation with adjacent landowners as required by SDCL 45-6B-44 for the land affected by the revision:

Delivered to DWNR March 15, 1988.

11. Proof of consultation with the Department of Game, Fish and Parks and the local conservation district, including any additional surveys and requirements considered necessary by those agencies:

To be submitted directly to DWNR by these agencies.

12. Proof of compliance with all county or city zoning ordinances and requirements or proof that the revision is in substantial compliance with the procedure for obtaining any necessary county or city permits:

Letter from Lawrence County attached.

13. A postmining reclamation map as required by SDCL 45-6B-7(8):

See Brohm's Permit Amendment Application - Exhibit 2-6.

14. The effect the revision has on the timetable and duration of the mining operation:

There will be no effect on the timetable or duration of the mining operation as a result of these revisions.

15. Baseline data and maps pursuant to the requirements of ARSD 74:29:03:07:

Applicant: Brohm Mining Corp.

Date of Technical Revision Request: September 2, 1988

Nature of Request: Petroleum Storage Technical Revision

<u>Date of Approval or Denial</u>: Conditionally Approved October 14, 1988

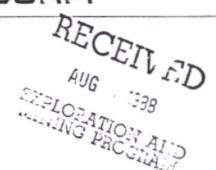
Conditions:

 Brohm Mining shall follow all requirements concerning this storage area set forth by the Office of Water Quality's Above Ground Storage Tank Program.

BROHM MINING CORP.

August 1, 1988

Mr. Mike Cepak
Department of Water and Natural Resources
Joe Foss Building
Pierre, South Dakota 57501



Dear Mike:

Per our telephone conversation Brohm Mining Corporation is requesting technical revisions for the three following Items:

1.) Waste Disposal Area slash.

Brohm's permit amendment proposed cutting, renoving and piling slash in areas below the waste dumps. Further evaluation showed that the slash could be cut and left in place without affecting the stability of the dumps. This concept is discussed in the attached letter from Steve Narkiewicz dated July 22, 1988.

2.) Tank for solution heater antiscalant.

As included in the permit amendment Brohm will use a heater to heat the leach solution during cold weather. An antiscalant (such as Millsperse 802) is necessary to prevent scale from forming inside the heating pipes. We will place a 60 mil H.D.P.E. liner over a bermed area adjacent to the surge pond.

Details of the tank and location are shown on drawing 20-415-01 and the 8.5"X11" drawing of the tank and bermed area.

3.) Surge pond water-table depression and monitoring wells.

Two wells have been drilled north of the surge pond. These wells are to be used to keep water away from the base of the surge pond and to detect any leakage that may occur. Sampling parameters will be the same as for the plant site french drain outlet.

If there are any questions or you need additional information call me at 578-2107

Sincerely,

John Wilbanks

John Wilbank

Director of Environmental Affairs

enc:

JW/scw

TECHNICAL REVISION

WASTE DISPOSAL AREA SLASH.

2. TANK FOR SOLUTION BEATER ANTISCALANT

RECESTION ED SURGE POND WATER-TABLE DEPRESSION AND MONITORING WELF

DATE: August 1, 1988

1. The operator's name:

Brohm Mining Corporation

2. The permit number:

Mining/Milling Permit No. 439 as acended.

A narrative description of the revision being proposed: 3.

Narrative description contained in letter from John Wilbanks to Mike Cepak dated August 1, 1988.

The legal description of land affected by the revision: 4.

See Volume I and II Application for Permit Amendment -January 1988.

A map in compliance with SDCL 45-6B-10 and ARSD 74:29:02:12, showing the land affected by the revision:

See Volume I and II Application for Permit Amendment -January 1988. Also enclosed are a map and flow chart showing how and where the wells and antiscalant tank fit into the process schene and are located.

The estimated cost of implementing and completing the reclamation of land affected by the revision:

The estimated cost of reclamation will not increase due to the changes proposed. Land affected by these changes have already been bonded at the maximum levels of disturbance under the current permit.

A description of the reclamation being proposed for the land affected by the revision:

These technical revisions will be accommodated under the existing reclanation plan as approved in March 1988. (See Brohm Mining Corporation - Application For Permit Amendment - 1988.)

The name and address of the surface owner of land affected by the revision:

See Volume I and II Application for Permit Amendment -January 1988.

9. The name and address of the mineral owner of land affected by the revision:

See Volume I and II Application for Permit Amendred January 1988.

10. An instrument of consultation with the surface owner as required by SDCL 45-6E-12 and proof of consultation with adjacent landowners as required by SDCL 45-6B-44 for the land affected by the revision:

Delivered to DWNR March 15, 1988.

11. Proof of consultation with the Department of Game, Fish and Parks and the local conservation district, including any additional surveys and requirements considered necessary by those agencies:

To be submitted directly to DWNR by these agencies.

12. Proof of compliance with all county or city zoning ordinances and requirements or proof that the revision is in substantial compliance with the procedure for obtaining any necessary county or city permits:

Letter to be submitted directly to DWNR by Lawrence County.

13. A postnining reclamation map as required by SDCL 45-68-7(8):

See Brohm's Permit Amendment Application - Exhibit 2-6.

14. The effect the revision has on the timetable and duration of the mining operation:

There will be no effect on the timetable or duration of the mining operation as a result of these revisions.

15. Baseline data and maps pursuant to the requirements of ARSD 74:29:03:07:

Please refer to Brohm's Permit Amendment Application for baseline data and maps for these areas.

TECHNICAL REVISION DOCUMENT

Applicant: Brohm Mining Corporation

Date of Technical Revision Request: August 3, 1988 (Supplemental information submitted August 18, 1988)

<u>Nature of Request</u>: To operate two dewatering and monitoring wells near the surge pond.

Date of Approval or Denial: September 28, 1988

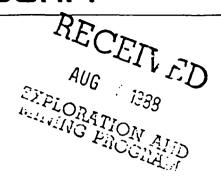
Conditions:

- 1. Brohm Mining shall obtain a water rights permit, if required, for the dewatering wells in accordance with SDCL 46-1 or 46-5, as applicable (contact Division of Water Rights).
- 2. Brohm Mining shall obtain a National Pollutant Discharge Elimination System General Permit for Construction Activities, if required, for the dewatering wells in accordance with ARSD 74:03:18:48 (contact Mary Yakawich, Division of Land and Water Quality).

BROHM MINING CORP.

August 1, 1988

Mr. Mike Cepak
Department of Water and Natural Resources
Joe Foss Building
Pierre, South Dakota 57501



Dear Mike:

Per our telephone conversation Brohm Mining Corporation is requesting technical revisions for the three following Items:

1.) Waste Disposal Area slash.

Brohm's permit amendment proposed cutting, removing and piling slash in areas below the waste dumps. Further evaluation showed that the slash could be cut and left in place without affecting the stability of the dumps. This concept is discussed in the attached letter from Steve Narkiewicz dated July 22, 1988.

2.) Tank for solution heater antiscalant.

As included in the permit amendment Brohm will use a heater to heat the leach solution during cold weather. An antiscalant (such as Millsperse 802) is necessary to prevent scale from forming inside the heating pipes. We will place a 60 mil H.D.P.E. liner over a bermed area adjacent to the surge pond.

Details of the tank and location are shown on drawing 20-415-01 and the 8.5"X11" drawing of the tank and bermed area.

3.) Surge pond water-table depression and monitoring wells.

Two wells have been drilled north of the surge pond. These wells are to be used to keep water away from the base of the surge pond and to detect any leakage that may occur. Sampling parameters will be the same as for the plant site french drain outlet.

If there are any questions or you need additional information call me at 578-2107

Sincerely,

John Wilbanks

John Wilbank

Director of Environmental Affairs

enc:

JW/scw

EROKM MINING CERP.

August 15, 1988

Mr. Michael Cepak
S.D. Dept. of Water and Natural Resources
Joe Foss Building
523 East Capitol Avenue
Pierre, SD 57501

Dear Mike:

The following is in response to our telephone conversation concerning the de-watering wells next to the surge pond. Preliminary indications derived by air lifting during well development show a yield of flow of two gallon per minute per well.

It is likely the yields will increase when water generated by snowmelts and heavy rains percolate through to the fill/native material interface. Maximum yields are expected to be about 30 gpm between both wells. Due to the uncertainty of these figures Brohm installed pumps in each well capable of pumping 50 gpm each thus designing in a large factor of safety to protect the integrity of the surge pond.

Discharge from these walls will be piped directly to the drop inlet structure connected to the Strawberry Creek culvert north-east of the surge pond. This method of discharge will protect surface channels from erosive flows while avoiding the reintroduction of water into a system that is already saturated by spring snow melt. Consideration was given to routing discharges into the surge pond but it was determined that the timing of pumping from these de-watering wells could coincide with surplus amounts of water already in the system from spring precipitation.

Sincerely,

John Wilbanks, Director Environmental Affairs

John Willanks

JW:st

Attachment

TECHNICAL REVISION DOCUMENT

Applicant: Brohm Mining Corp.

Date of Technical Revision Request: August 3, 1988

Nature of Request: To leave slash in waste disposal area, to install an antiscalant tank, and to operate two dewatering and monitoring wells near the surge pond.

Date of Approval or Denial: Conditionally approved August 23, 1988

Conditions:

- 1. Brohm Mining shall remove all salvageable topsoil from the waste disposal area.
- 2. All marketable timber shall be removed from the waste disposal areas. All non-marketable timber exceeding six inches in diameter shall also be removed and disposed of properly.
- 3. During final reclamation and regrading of the waste disposal areas all trees and topsoil shall be removed from the area that will be covered with waste cutside of the toe of the end dumped area.
- 4. Slash to be left shall be laid flat prior to covering with waste.

Antiscalant Tank

1. Brohm Mining shall submit to the Department evidence by October 1, 1988, that the antiscalant acid is compatible with the EDPE liner material.

BROHM MINING CORP. AECET

Mr. Michael Cepak, Engineer S.D. Dept. of Water & Natural Resources Exploration and Mining Program Joe Foss Building 523 East Capitol Ave. Pierre, SD 57501

RE: Technical Revision of Gilt Edge to Increase Size of Diatomaceous Earth Pond and Leach Pad Liner

Dear Mr. Cepak:

Brohm plans to make some minor changes in the design and construction of the leach pad and diatomaceous earth pond. These changes are shown on the attached drawings and require approval from DWNR as technical revisions. A list of associated regulatory items with responses is also attached.

We need to increase the size of the diatomaceous earth pond to 120 feet long and 35 feet wide. The depth will remain the same. This change will better facilitate the cleaning of the pond with the back hoe.

We also need to extend the leach pad on the east side by about 47 feet and make adjustment on the haul road to keep it at a width of 45 feet. We will crown the haul road in the center so the area of drainage for the leach pad will remain the same. This change will extend the width of the leach pad by approximately 47 feet to a total width of approximately 485 feet. The lined part of the leach pad will increase from about 10 acres to 11.5 acres. This area was part of the haul road and the water balance included all of the haul road in the calculations.

The proposed change is necessary so that the required amount of ore can be stacked in each cell while maintaining 5 to 15 feet clear space between the ore and the edge of each cell. This space will assure that the spray from a particular cell will not reach any other cell and the ore can be off-loaded safely without damaging the cell separation curbs.

The proposed change will have no effect on the overall footprint of the leach pad since the outer boundary of the leach pad stays the same. This means that the collection area for precipitation events stays the same and the location of the game-tight fence remains unchanged. Solution flowrates on and off of each cell are unchanged as is the leaching and neutralization cycle.

Mr. Michael Cepak May 27, 1988 Page 2

Exployed 1000 never opion never opion would We have approval from Lawrence County and the Soil Consect Service. A letter will be sent directly to you from Game, Chirab and Parks. Construction is scheduled to start soon and we would appreciate an early response.

If there are any questions or you need additional information, please call me or Dan Blakeman.

Thank you.

Sincerely,

Brohm Mining Corporation

Jahr Willoutes

John Wilbanks

Dir. - Environmental Affairs

JW/dvl

TECHNICAL REVISION FOR DIATOMACEOUS RECENTER POND AND LEACH PAD

1. The operator's name:

Brohm Mining Corporation

The permit number:

Mining/Milling Permit No. 439 as amended.

A narrative description of the revision being proposed: 3. See attached diatomaceous earth pond narrative and leach pad revision narrative.

The legal description of land affected by the revision:

See Volume I and II Application for Permit Amendment -January 1988.

A map in compliance with SDCL 45-6B-10 and ARSD 74:29:02:12, showing the land affected by the revision:

See Volume I and II Application for Permit Amendment -January 1988.

The estimated cost of implementing and completing the reclamation of land affected by the revision:

The estimated cost of reclamation will not increase due to the changes proposed. Land affected by these changes have already been bonded at the maximum levels of disturbance under the current permit.

A description of the reclamation being proposed for the land affected by the revision:

These technical revisions will be accommodated under the existing reclamation plan as approved in March 1988. (See Brohm Mining Corporation - Application For Permit Amendment -1988.1

The name and address of the surface owner of land affected by the revision:

See Volume I and II Application for Permit Amendment -January 1988.

The name and address of the mineral owner of land affected 9. by the revision:

See Volume I and II Application for Permit Amendment -January 1988.

10. An instrument of consultation with the surface winter, as required by SDCL 45-6B-12 and proof of consultation with adjacent landowners as required by SDCL 45-6B-44 for the land affected by the revision:

Delivered to DWNR March 15, 1988.

11. Proof of consultation with the Department of Game, Fish and Parks and the local conservation district, including any additional surveys and requirements considered necessary by those agencies:

To be submitted directly to DWNR by agencies.

12. Proof of compliance with all county or city zoning ordinances and requirements or proof that the revision is in substantial compliance with the procedure for obtaining any necessary county or city permits:

Letter to be submitted to DWNR after May 25 County meeting.

13. A postmining reclamation map as required by SDCL 45-6B-7(8):

Please refer to Brohm's Permit Amendment Application - Exhibit 2-6.

14. The effect the revision has on the timetable and duration of the mining operation:

There will be no effect on the timetable or duration of the mining operation as a result of these revisions.

15. Baseline data and maps pursuant to the requirements of ARSD 74:29:03:07:

Please refer to Brohm's Permit Amendment Application for baseline data and maps for these areas.

TECHNICAL REVISION DOCUMENT

Applicant: Brohm Mining Corporation

<u>Date of Technical Revision Request</u>: May 18, 1988 (Supplemental Information submitted May 31, 1988)

Nature of Request: To increase the Diatomaceous Earth (D.E.) pond from 60 feet long by 35 feet wide to 120 feet long and 35 feet wide. Also, to extend the leach pad 47 feet east and adjust the haul road on the east side of the leach pad accordingly.

Date of Approval or Denial: Conditionally Approved June 2, 1988

Conditions:

1. Construction of the expansion areas of the diatomaceous earth pond and leach pad shall follow the plans and specifications, conditionally approved April 18, 1988, and May 25, 1988, for these facilities. Construction of the expansion areas shall also comply with conditions placed on the approval of the plans and specifications for these facilities.

Department of Yater & Natural Resources

Joe Foss Building 523 East Capitol Pierre, South Dakota 57501-3181

January 31, 1990

Lance Hubbard
Safety/Security Supervisor
Brohm Mining Corporation
P.O. Box 485
Deadwood, SD 57732

RE: Caustic Soda Pumping Facility Technical Revision

Dear Mr. Hubbard:

Departmental review of the technical revision submitted January 19, 1990, regarding the above mentioned revision, has been completed. As a result of this review, the conditional approval for installing a storage building for the caustic soda pumping facility has been granted. The approval is contingent on Brohm Mining complying with the following:

1. Brohm Mining shall notify the Department immediately upon caustic soda spillage. This notification shall follow procedures set forth in the spill contingency plan.

This letter serves only to conditionally approve the technical revision to install a storage building for the caustic soda pumping facility. This letter in no way is to be construed as agreement to, or approval of, any future plans associated with the project. Approval of this technical revision does not in any way release the application from responsibility that the project will be an operable facility when construction is completed. Brohm Mining may proceed with the work outlined in the approved technical revisions upon compliance with the above conditions.

Should you have any questions concerning this matter, please do not hesitate to contact this Office (Phone: (605) 773-4201).

Sincerely,

Raymond F. Birchem, P.E.

Gagner F. Buchen, P.E.

Staff Engineer

Department of Water and Natural Resources

Phone: (605) 773-3296

Department of Nater & Natural Resources

Joe Foss Building 523 East Capitol

Pierre, South Dakota 57501-3181

November 30,03989

Mr. Lance Hubbard
Safety/Security Supervisor
Brohm Mining Corporation
P.O. Box 485
Deadwood, SD 57732

RE: The loading and leaching of Cell 7

Dear Mr. Hubbard:

The Department is in receipt of your letter telefaxed this date (your letter dated November 30, 1989), requesting permission to load Cell 7 with ore. The letter was submitted pursuant to Condition No. 9 of the September 12, 1989 technical revision approval for the relining of the Brohm Leach Pad. The Department hereby approves Cell 7 for loading and operational leaching.

If you have any questions regarding this approval, please feel free to call our office.

Sincerely,

Michael D. Cepak

Michael D Copok

Program Chief

Exploration and Mining Program

Telephone: (605) 773-4201



Department of Water & Natural Resources

Joe Foss Building 523 East Capitol Pierre, South Dakota 57501-3181

November 22, 1989

Mr. Scott Wandstedt Brohm Mining Corporation PO Box 485 Deadwood, SD 57732

RE: Sealing of North Ruby Gulch Mine Shaft

Dear Mr. Wandstedt:

Departmental review has been completed for the plans and specifications submitted November 20, 1989 regarding the sealing of the North Ruby Gulch mine shaft. This is pursuant to Condition No. 5, page 12 of Brohm's Mine Permit No. 439 Amendment Conditions. Conditional approval of the plans has been granted contingent upon Brohm complying with the following conditions:

- 1) Brohm shall notify Mark Keenihan at the DWNR's Rapid City office 24 hours prior to sealing the shaft in order that he may witness the closure.
- 2) To minimize downward migration of leachate through the backfilled soil and rock material (more permeable than the surrounding undisturbed ground) sandwiched between the two bentonite layers, a 10 ft. by 10 ft. sheet of 80 mil VLDPE shall be placed over the backfilled shaft. The plastic shall be covered with enough rock to hold it in place when the toe of the spent ore dump advances over it.

This letter serves only to approve the plans and specifications for sealing the North Ruby Gulch shaft. This letter in no way is to be construed as agreement to, or approval of, any future plans or revisions associated with the project. Brohm may proceed with the work outlined in the November 20, 1989 correspondence upon compliance with the above conditions.

Should you have any questions concerning this matter, please do not hesitate to contact this office.

Sincerely,

Thomas V. Durbin

Thomas V. Durkin Hydrologist Exploration & Mining F

Exploration & Mining Program Telephone: (605) 773-4201

cc: Mark Keenihan, DWNR-Rapid City Office





Joe Foss Building 523 East Capitol Pierre, South Dakota 57501-3181

erchm michg co.

November 20, 1989

Mr. Lance Hubbard
Safety/Security Supervisor
Brohm Mining Corporation
P.O. Box 485
Deadwood, South Dakota 57732

RE: The loading and leaching of Cell 6

Dear Mr. Hubbard:

The Department is in receipt of your letter submitted November 17, 1989, requesting permission to load Cell 6 with ore. The letter was submitted pursuant to Condition No. 9 of the September 12, 1989 technical revision approval for the relining of the Brohm Lead Pad. The Department hereby approves Cell 6 for loading and operational leaching.

If you have any questions regarding this approval, please feel free to call our office.

Sincerely,

Bric Holm

Natural Resources Engineer Exploration and Mining Program

ie Holm

Telephone: (605) 773-4201



Department of Vater & Natural Resources

Joe Foss Building 523 East Capitol Pierre, South Dakota 57501-3181

October 26, 1989

TOTAL STORY

erohet meyng co.

Mr. Lance Hubbard Safety/Security Supervisor Brohm Mining Corporation Deadwood, South Dakota 57732

RE: Batten-strip VLDPB to Pipe Penetration Concrete

Dear Mr. Hubbard:

The Department is in receipt of your letter submitted October 25, 1989, regarding the battening of the VLPDE to the pipe penetration concrete. The Department concurs with Brohm's assessment that battening in this case would be better than booting the various solution pipes. The Department hereby approves battening the VLDPE to the pipe penetration concrete.

If you have any questions regarding this matter, please feel free to call our office.

Sincerely,

Raymond F. Birchem, P.B.

um I F. Brisker, P.E.

Staff Engineer

Department of Water and Natural Resources

Telephone: (605) 773-3296



Department of Yater & Natural Resources

Substitution of the Court of th

October 17, 1989

Mr. Scott Wandstedt Environmental Specialist Brohm Mining Corporation PO Box 485 Deadwood, SD 57732

RE: Heap Neutralization, Mine Permit Condition A-1 and B-1

Dear Scott:

Based on the results of the effluent characterization of Cell 5, enclosed with your September 29, 1989 letter, cadmium must be added to the list of parameters to be analyzed in the neutralized effluent or pore water prior to off-loading future heaps. In short, the following revised list of parameters must be analyzed:

Cl	As	NO3
S04	Cu	NO2
рH	Ag	инз
WAD CN	Zn	
TDS	Cd	

If you have any questions, please don't hesitate to contact me.

Sincerely,

Thomas V. Durkin

Thima 1. Du

Hydrologist

Exploration & Mining

Telephone: (605) 773-4201

CELEBRATE SUBJECTION

Nater & Natural Resources

Joe Foss Building 523 East Capitol Pierre, South Dakota 57501-3181

> . Bo busha chin

October 13, 1989

Mr. Lance Hubbard Safety/Security Supervisor Brohm Mining Corporation P.O. Box 485 Deadwood, SD 57732

RE: The loading and leaching of Cell 5

Dear Mr. Hubbard:

The Department is in receipt of your letter submitted October 13, 1989, requesting permission to load Cell 5 with ore. The letter was submitted pursuant to Condition No. 9 of the September 12, 1989 technical revision approval for the relining of the Brohm Leach Pad. The Department hereby approves Cell 5 for loading and operational leaching.

If you have any questions regarding this approval, please feel free to call our office.

Sincerely,

Michael D. Coah Michael D. Cepak

Program Chief

Exploration and Mining Program

Telephone: (605) 773-4201



Department of Vater & Natural Resources

Joe Foss Building 523 East Capitol Pierre, South Dakota 57501-3181

October 10, 1989

Mr. Lance Hubbard Safety/Security Supervisor Brohm Mining Corporation P.O. Box 485 Deadwood, SD 57732

RE: The loading and leaching of Cell 2

Dear Mr. Hubbard:

The Department is in receipt of your letter submitted October 10, 1989 (your letter dated October 9, 1989), requesting permission to load Cell 2 with ore. The letter was submitted pursuant to Condition No. 9 of the September 12, 1989 technical revision approval for the relining of the Brohm Leach Pad. The Department hereby approves Cell 2 for loading and operational leaching.

If you have any questions regarding this approval, please feel free to call our office.

Sincerely,

Michael D. Cepak

Michael D agach

Program Chief

Exploration and Mining Program

Telephone: (605) 773-4201



Department of Vater & Natural Resources

Joe Foss Building 523 East Capitol Pierre, South Dakota 57501-3181

October 5, 1989

Lance Hubbard
Safety/Security Supervisor
Brohm Mining Corporation
PO Box 485
Deadwood, SD 57732

RE: Neutralization Solution Heating System and Carbon Adsorption System Technical Revision

Dear Lance:

Departmental review of the technical revision submitted September 28, 1989 regarding the above mentioned revision, has been completed. As a result of this review, the conditional approval for installing the neutralization solution heating system and the carbon adsorption system has been granted. The approval is contingent on Brohm Mining complying with the following:

- 1. Since there may be sharp aggregates in the concrete mix, Brohm Mining shall take steps to prevent damage to the 80 mil VLDPE liner during the pouring of concrete.
- 2. The thickness of the VLDPE shall be plus or minus 10 percent of 80 mil. This thickness shall be measured at minimum frequency of 1 measurement per 100 feet of VLDPE.
- 3. All holes greater than one-sixteenth inch (1/16") diameter shall be patched using a piece of VLDPE membrane. Holes smaller than one-sixteenth inch (1/16") may be repaired using an extrusion weld bead. Vacuum testing procedures for extrusion welds described in previously approved plans and specifications shall apply.
- 4. Brohm Mining shall submit the resumes and qualifications of personnel involved in the construction quality assurance (CQA) of the lining system by October 10, 1989. Brohm Mining shall notify the Department of CQA personnel changes prior to their commencement of work.



- 5. Brohm Mining shall notify the Department of liner completion and request Departmental approval prior to the policing of concrete.
- 6. Brohm Mining shall follow all other applicable liner installation specifications approved for the reach pad reline project.

This letter serves only to conditionally approve the above mentioned revision. This letter in no way is to be construed as agreement to, or approval of, any future plans associated with the project. Approval of this technical revision does not in any way release the application from responsibility that the project will be an operable facility when construction is completed. Brohm Mining may proceed with the work outlined in the approved technical revisions upon compliance with the above conditions.

Should you have any questions concerning this matter, please do not hesitate to contact this Office (Phone: (605) 773-4201).

Sincerely,

Lagrand F. Birlan, P.E.

Raymond F. Birchem, P.E.

Staff Engineer

Department of Water and Natural Resources

Phone: (605) 773-3296

Department of Vater & Natural Resources

Joe Foss Building 523 East Capitol Pierre, South Dakota 57501-3181

November 3, 1989

Mr. Lance J. Hubbard
Safety/Security Supervisor
Brohm Mining Corporation
PO Box 485
Deadwood. SD 57732

RE: Brohm Mining Permit 439 Technical Revision for Modification of Compliance Limits for Chemical Parameters.

Dear Mr. Hubbard:

Departmental review of material submitted by Brohm Mining Corporation (October 27 and 30, 1989) requesting approval of a one year interim testing period during which the currently approved pore-water/solid sampling method may be used to determine off-load criteria for WAD cyanide (WAD CN) has been completed. As a result of this review and our October 24, 1989 meeting, the Department hereby grants approval contingent upon Brohm complying with the following conditions:

- 1) Heaps may not be off-loaded until the pore water test results show compliance with ARSD 74:29:05:08 and the effluent collected from the toe of the heap exhibits a concentration of 2.0 ppm WAD CN or less. This is required because the tonnage calculation included in the October 6, 1989 ASCI report are based on 2.0 ppm WAD CN concentrations.
- 2) Brohm shall submit a cumulative log of all spent ore off-loaded during the interim period each time a heap is off-loaded and within one week of off-loading. The log shall include the tonnages off-loaded. It shall also include a calculation of the total mass of additional WAD CN deposited in Ruby Gulch based on spent ore off-loaded in which the pore water test was used and the effluent was greater than 0.5 ppm but less than or equal to 2.0 ppm WAD CN. The WAD CN calculation shall be as follows:

(Tons of spent ore off-loaded)(% moisture/100)(effluent concentration in ppm/1,000,000)(2,000 lb/ton) = lbs of WAD CN.

Percent moisture shall be calculated from samples taken at the toe of the heap. In no case shall the off-loaded mass of additional WAD CN exceed 221 lbs.



Be aware that any spent ore off-loaded using the currently approved effluent test that meets 0.5 ppm WAD CN need not be included in the mass of additional WAD CN calculation. Please keep the log simple and to the point.

3) The following groundwater monitoring schedule shall be incorporated into Brohm's current operational hydrologic monitoring plan:

Monitoring Station	Sampling Frequency	Parameters to be Tested
GW-12	Monthly	pH, Conductivity, TDS NO3, Total & WAD CN, Water level.
GW-13	Monthly	pH, Conductivity, TDS, HCO3, SO4, Total & WAD CN, Na, As, Cd, Cu, Se, Zn, NO3, Water level.

In addition to WAD CN, be aware that the DWNR will be monitoring effluent concentrations of other key parameters that are above standards in a typical pregnant solution (i.e., Cl, SO4, pH, TDS, As, Cu, Ag, Zn, Cd, NO3, NO2, & NH3) to determine what these concentrations are when effluent WAD CN concentrations are between 0.5 and 2.0 ppm. This information will be used in the future by the DWNR to assess the potential impacts these parameters may have on the environment when off-loading at higher effluent WAD CN concentrations.

Based on the ASCI testing program results, it should be understood that DWNR reserves the right to make the final decision on approving alternative neutralization testing methods.

This letter serves only to conditionally approve the technical revision to use the pore water test method to determine off-load criteria for the interim test period. This letter in no way is to be construed as agreement to, or approval of, any future plans associated with the project. Brohm may proceed with the work outlined in the technical revision contingent upon compliance with the above conditions.

If you have any questions concerning this matthesitate to contact this office.

Sincerely,

Thomas V. Dubin

Thomas V. Durkin

Hydrologist

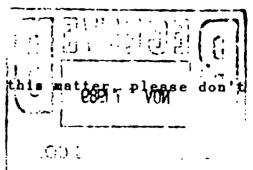
Exploration & Mining Program

Telephone: (605) 773-4201

cc: Floyd Matthew, Department Secretary

Adrian Smith and Terry Mudder, ASCI

Ron Sieg, GF&P





Joe Foss Building 523 East Capitol Pierre, South Dakota 57501-318

翻除 5 TO

September 29, 1989

Mr. Lance Hubbard Safety/Security Supervisor Brohm Mining Corporation P.O. Box 485 Deadwood, SD 57732

RE: The loading and leaching of Cell 3

Dear Mr. Hubbard:

The Department is in receipt of your letter submitted September 29, 1989 (your letter dated September 28, 1989), requesting permission to load Cell 3 with ore. The letter was submitted pursuant to Condition No. 9 of the September 12, 1989 technical revision approval for the relining of the Brohm Leach Pad. The Department hereby approves Cell 3 for loading and operational leaching.

If you have any questions regarding this approval, please feel free to call our office.

Sincerely,

Michael D. Cepak

Program Chief

Exploration and Mining Program

Telephone: (605) 773-4201

Michael D Capale



Department of Nater & Natural Resources

Joe Foss Building 523 East Capitol Pierre, South Dakota 57501-3181

September 28, 1989

Mr. Lance Hubbard
Safety-Security Supervisor
Brohm Mining Corporation
P. O. Box 485
Deadwood, South Dakota 57732

Dear Mr. Hubbard:

As per your letter of September 20, 1989, the three Sioux Model D-3000, 3,000,000 BTU/hr hot water heaters are exempt from permitting requirements as stated in ARSD 74:26:01:45.

This regulation states: A permit or variance for the operation of a source is required for all sources with the following exceptions:

(4) A device or apparatus which has a heat input capability of not more than 3,500,000 BTU's per hour.

If you have any further questions regarding the status of these units, please contact me at (605) 773-3153.

Sincerely,

Keith Gestring

Natural Resources Engineer

Division of Air Quality and Solid Waste



Department of Nater & Natural Resources

Joe Foss Building 523 East Capitol Pierre, South Dakota 57501-3181

September 19, 1989

Mr. Lance Hubbard Safety/Security Supervisor Brohm Mining Corporation P.O. Box 485 Deadwood, SD 57732

RE: Condition No. 10 of September 12, 1989 Technical Revision to Reline Leach Pad - Submission of Hydrostatic Test Plan

Dear Mr. Hubbard:

Departmental review has been completed for the hydrostatic testing program plan submitted September 12, 1989. Based upon this review the Department will not require hydrostatic tests to be performed on the VLDPE liner for the relined cells of the leach pad, although Brohm Mining may still perform the hydrostatic test under their own volition. The main reason for this is that the secondary leak detection, collection and recovery system (LDCRS) was not designed specifically as a LDCRS, but as a cushion layer. This layer has a low permeability and a slow leakage response time, meaning that leakage may take very long times to report to the monitoring points. The response time would be on the order of several days or weeks depending upon the size of the leak, and the distance to the monitoring point.

The Department in its review also looked at performing the hydrostatic test on the cushion layer and at full heap height in order to establish a hydraulic head on the VLDPE. The problem of the slow response time in the secondary LDCRS remained, and there were the additional problems of locating and repairing leaks with the cushion layer and ore in place. In these evaluations it became apparent that hydrostatic testing of the VLDPE could not be effective due to the long response times of the secondary LDCRS and other problems.

Also, the Department does not consider the VLDPE liner to be the primary liner, but it is considered to be a repair of the primary liner. The action leakage rate (ALR) schedule and leakage responses still apply to the original liner.

Should you have any questions concerning this matter, please do not hesitate to contact the Exploration and Mining

Sincerely,

Mechael D. Cepal Michael D. Cepak

Program Chief

Exploration and Mining Program Telephone: (605) 773-4201

Mater & Natural Resources

Joe Foss Building 523 East Capitol Pierre, South Dakota 57501-3181

September 18, 1989

Mr. Lance Hubbard Safety/Security Supervisor Brohm Mining Corporation P.O. Box 485 Deadwood, SD 57732

RE: Conditions on Brohm Mining Technical Revision to Reline Leach Pad

Dear Mr. Hubbard:

The Department has been in contact with Glen Hugueley of Vector concerning the specifications for testing wedge welded seams. Condition No. 4 of the September 12, 1989 approval letter for the reline technical revision was written to HDPE specifications. These specifications do not reflect the industry standards for VLDPE and the Department is revising Condition No. 4 as follows:

4. For testing welded seams, 100 percent of the wedge welded seam shall be air pressure tested. The allowable pressure drop for the compressed air test shall be 2 pounds per square inch (psi) over a 5-minute interval at a pressure of 30 psi. Otherwise, the leak shall be located and the area repaired. For seams that are extrusion welded, the vacuum testing procedure described in the approved plans and specifications shall apply.

Should you have any questions concerning this matter, please do not hesitate to contact the Exploration and Mining Program at (605) 773-4201.

Sincerely;

Raymond P. Birchem, P.E.

Staff Engineer

Department of Water and Natural Resources

Telephone: (605) 773-3754





Joe Foss Building 523 East Capitol Pierre, South Dakota 57501-3181

September 12, 1989

Mr. Lance Hubbard Safety/Security Supervisor Brohm Mining Corporation P.O. Box 485 Deadwood, SD 57732

RE: Brohm Mining Permit 439 Technical Revision - Plans and Specifications Changes Submitted September 8, 1989

Dear Mr. Hubbard:

Departmental review has been completed for the technical revision submitted September 8, 1989, regarding the following plans and specifications changes:

The relining of the leach pad;

 The replacement of the 8-inch diameter outlet pipes on the leach pad with 10-inch diameter pipes; and

3. The addition of a 10-inch diameter neutralization return line to the neutralization pond, and the replacement of the 6-inch diameter neutralization on-solution line with a 8-inch diameter line.

Based upon the Departmental review, the conditional approval for the technical revision has been granted. This approval is contingent upon Brohm Mining complying with the following conditions:

- Brohm Mining shall submit details of the anchor trenches for the VLDPE liner as soon as practicable.
- 2. Referring to the drawings entitled "Concrete Transition Berm" and "Liner System Transition at Concrete Berm" in the Technical Support Document for the Proposed Technical Revision to the Gilt Edge Leach Pad, Brohm Mining shall use fill material (sand, polyethylene foam, or other material) to reduce the 90 degree bends on the concrete curbs to 45 degrees, to facilitate

Mr. Lance Hubbard September 12, 1989 Page 2

laying of, and to reduce stress points on, the VLDPE liner. Brohm Mining need not install the fill at pipe outlet sections of the curbs.

- The details of the geotechnical stability study (STABL4 program) shall be submitted as soon as practicable.
- 4. For testing welded seams, 100 percent of the wedge welded seam shall be air pressure tested. The allowable pressure drop for the compressed air test shall be 2 pounds per square inch (psi) over a 5-minute interval at a pressure of 30 to 40 psi. Otherwise, the leak shall be located and the area repaired. For seams that are extrusion welded, the vacuum testing procedures described in the approved plans and specifications shall apply.
- 5. The thickness of the VLDPE shall be plus or minus 10 percent of 80 mil. This thickness shall be measured at minimum frequency of 1 measurement per 100 feet of VLDPE.
- 6. All holes greater than one-sixteenth inch (1/16") diameter shall be patched using a piece of VLDPE membrane. Holes smaller then one-sixteenth inch (1/16") may be repaired using an extrusion weld bead.
- 7. Brohm Mining shall check the condition of existing exposed HDPE liner prior to placement of the VLDPE liner. The HDPE shall be repaired as necessary.
- 8. Brohm Mining shall submit the resumes and qualifications of personnel involved in the construction quality assurance (CQA) of the lining system by September 15, 1989. Brohm Mining shall notify the Department of CQA personnel changes and shall submit resumes for new CQA personnel prior to their commencement of work.
- 9. Brohm Mining shall notify the Department of completion of repair to each cell and request Departmental approval prior to loading of the cell.
- 10. Brohm Mining shall submit a plan for Departmental approval regarding hydrostatic testing of the repaired cells. The plan shall be submitted prior to loading the repaired cells.

Mr. Lance Hubbard September 12, 1989 Page 3

11. Brohm Mining shall provide the Department's field inspector or representative a copy of the VLDPE panel layout plan when it is available.

This letter serves only to conditionally approve the technical revision to reline the leach pad and to make piping changes. This letter in no way is to be construed as agreement to or approval of any future plans associated with the project. Approval of this technical revision does not in any way release Brohm Mining from responsibility that the project will be an operable facility when construction is completed. Brohm Mining may proceed with the work outlined in the approved technical revision upon compliance with the above conditions.

Should you have any questions concerning this matter, please do not hesitate to contact the Exploration and Mining Program at (605) 773-4201.

Sincerely,

Raymed F. Busher, P.E.

Raymond F. Birchem, P.E.

Staff Engineer

Department of Water and Natural Resources

Telephone: (605) 773-3754

121 1 3 1993

STATE OF SOUTH DAKOTA



OFFICE OF ATTORNEY GENERAL

STATE CAPITOL
Pierre, Snuth Dakota \$7501-5090
Phone (605) 773-3215

ROGER A, TELLINGHUISEN ATTORNEY GENERAL

August 17, 1989

TO:

Mr. Robert Townsend

Mining Program

Department of Water and Natural Resources

FROM:

Roxanne Giedd, Assistant Attorney General

RE:

Brohm Mining Permit

Brohm Mining Permit No. 439 contains a condition which allows a technical revision to be approved by the Department of Water and Natural Resources for compliance limits for chemical parameters (condition: Technical Revision # 5). It is my understanding that Brohm is considering the submission of a technical revision which would either alter the specified cyanide level or the specified testing method for determining the cyanide level, and the neutralization of Brohm's heaps. That type of request appears to be authorized by Permit 439 Condition: Technical Revisions # 5.

An alteration to the cyanide level or testing method through an approved technical revision as outlined above would not require Brohm to amend its Ground Water Construction Permit. This is based upon the temporary amendment to Brohm's Construction Permit, effective on April 21, 1989, which specifically states that cyanide concentrations have been set by the South Dakota Mining Permit No. 439. I interpret that condition to be an adoption by reference of the cyanide levels set pursuant to Mining Permit No. 439, which would include alterations lawfully made to those levels through a technical revision.

RG:mas

cc: Floyd Matthew

Steve Pirner Barb Nielson

Department of Vater & Natural Resources

Joe Foss Building 523 East Capitol Pierre, South Dakota 57501-3181

June 14, 1989

Jim Thompson
Plant Superintendent
Brohm Mining Corporation
P.O. Box 485
Deadwood, SD 57732

RE: Surge Pond Drip Tubing Technical Revision

Dear Jim:

Departmental review of the technical revision submitted May 30, 1989; regarding the above mentioned revision, has been completed. As a result of this review, the conditional approval for installing half inch drip tubing around the inside of the surge pond to help control solution balance has been conditionally approved. The approval is contingent on Brohm Mining complying with the following condition:

1. Brohm Mining shall ensure that the surge pond liner is protected from punctures and other such damage during the installation of the tubing. Nylon rope, plastic coated wire, or other such protective material shall be used to attach the tubing to the points discussed in our June 8, 1989 phone conversation.

This letter serves only to conditionally approve the technical revision to install this drip tubing on the surge pond. This letter in no way is to be construed as agreement to, or approval of any future plans associated with the project. Approval of this technical revision does not in any way release Brohm from responsibility that the project will be an operable facility when this installation is completed.

If you have any questions concerning this matter, please do not hesitate to contact this Office. (Phone: (605)773-4201).

Sincerely,

Raymond F. Birchem, P.E.

Staff Engineer

Department of Water and Natural Resources

Phone: (605) 773-3296

eohn minice ()

TW 1 2 1888

(ELEBRAT)

Department of Vater & Natural Resources

Joe Foss Building 523 East Capitol Pierre, South Dakota 57501-3181

June 9, 1989

Mr. Jim Thompson Plant Supervisor Brohm Mining Corporation P.O. Box 485 Deadwood, SD 57732

Re: Brohm Mining Permit 439 Technican Revision - Plans and Specifications Change and Revising Processes for Cyanide Destruction submitted May 19, 1989.

Dear Mr. Thompson:

Departmental review has been completed for Technical Revision submitted May 19, 1989, regarding the addition of another pump and additional piping at the neutralization area to enable Brohm to place more neutralized solution onto the heaps. This modification falls under Technical Revision No. 2 (plans and specifications) or Technical Revision No. 9 (adopting new processes for cyanide destruction) of the conditions attached to the April 21, 1988 Amendment to Mining Permit 439. As a result of this review, the approval for the Technical Revision to install the additional pump and piping has been granted.

This letter serves only to approve the Technical Revision to allow installation of an additional pump and additional piping to the neutralization circuit. This letter in no way is to be construed as agreement to, or approval of, any future plans associated with the project. Approval of this technical revision does not in any way release the applicant from responsibility that the project will be an operable facility when construction is completed.

Should you have any questions concerning this matter, please do not hesitate to contact this office (Phone: (605) 773-4201).

Sincerely,

Raymond F. Birchem, P.E.

. Laymond F. Buchen, PE

Staff Engineer

Department of Water and Natural Resources

Phone: (605) 773-3754

cc: Carl Seward, Brohm



Department of Water & Natural Resources

Joe Foss Building 523 East Capitol Pierre, South Dakota 57501-3181

April 4, 1989

Mr. Rex L. Outzen General Manager Brohm Mining Corporation PO Box 485 Deadwood, SD 57732

RE: Technical Revision of Mine Permit 439 Variance to Off-load - pH, NO2, TDS

Dear Mr. Outzen:

Departmental review has been completed for the technical revision submitted March 16, 1989 regarding off-load criteria and the variance for pH, NO2, and TDS. As a result of this review, the conditional approval of the technical revision has been granted. This approval is contingent upon Brohm complying with the following conditions:

- 1) Brohm shall obtain the appropriate groundwater discharge permit amendment in accordance with ARSD 74:03:15 and ARSD 74:03:16.
- 2) The disposal area in Ruby Gulch must have a minimum of 2 feet of soil present for attenuation purposes. Only cell 6 is currently approved to be off-loaded, upon compliance with condition number 1 above.
- 3) Based on the current cell 6 neutralization results and the intensive treatment characterization to be completed on the next heap to be neutralized (cell 1), specific off-load criteria limits will be determined.

This letter serves only to approve the technical revision for off-loading cell 6. This letter in no way is to be construed as agreement to, or approval of, any future plans or revisions associated with the project. Brohm may proceed with the work outlined in the technical revision upon compliance with the above conditions.



Should you have any questions regarding this matter, please don't hesitate to contact this Office.

Sincerely,

Thomas V. Durbin. Thomas V. Durkin

Hydrologist

Exploration & Mining Program

Telephone: (605) 773-4201

Statillian V. .

Department of Vater & Natural Resources

Joe Foss Building 523 East Capitol Pierre, South Dakota 57501-3181

March 24, 1989

Mr. Pete Goodwin
Personnel/Govt. Affairs
Brohm Mining Corporation
P.O. Box 485
Deadwood, South Dakota 57732

RE: Technical Revision for the additional of acid to lower the pH of neutralized material (submitted March 1, 1989).

Dear Mr. Goodwin:

This letter is to inform you that the Department has stopped processing of the above referenced Technical Revision. The Department was informed by TextOfficer in a meeting with the staff on March 15, 1989 in Pietres that the Technical Revision could be cancelled, as Brohm will be amending their groundwater discharge to allow for the higher Haevels.

Should you have any questions concerning this matter please do not hesitate to contact this Office.

Sincerely,

Michael D. Cepak

Natural Resources Engineer

Exploration and Mining Program

Telephone: (605) 773-4201



Department of Vater & Natural Resources

Joe Foss Building 523 East Capitol Pierre, South Dakota 57501-3181

March 31, 1989

Mr. Lance Hubbard Supervisor Safety and Security Brohm Mining Corporation P.O. Box 485 Deadwood, SD 57732

Re: Brohm Mining's Leakage Response Action Plan

Dear Mr. Hubbard:

Department review has been completed for the modifications and corrections to the Leakage Response Action Plan (RAP) submitted March 28, 1989 (your letter dated March 27, 1989). As a result of this review, approval of the modifications and corrections to the RAP has been granted.

It is the Department's understanding that the modifications and corrections will be incorporated into a final draft of the RAP which will be submitted to the Department as soon as practicable.

Should you have any questions concerning this matter, please do not hesitate to contact this office.

Sincerely,

Michael D Cepah

Michael D. Cepak Program Chief Exploration and Mining Program Telephone: (605) 773-4201

A33006MC.sm

HR - 3 1989

Alain Department of Water & Natural Resources

Joe Foss Building 523 East Capitol Plane, South Dakota 57501-3181

March 3, 1989

Dan Blakeman Process Superintendent Brohm Mining Corporation P.O. Box 485 Deadwood, SD 57732

Re: Coagulant and Anti-Scalent Storage Technical Revision

Dear Dan:

Departmental review of the technical revision submitted February 23, 1989, regarding the above mentioned revision, has been completed. As a result of this review, the conditional approval for installing storage buildings for coagulant and anti-scalent to comply with the requirements in ARSD 74:03:30 has been granted. The approval is contingent on Brohm Mining complying with the following:

- 1. Brohm Mining shall install a containment system for each of the buildings. The containment system shall consist of berms constructed around the base of the building, capable of containing the volume of the tank or capable of directing the leakage to another approved containment facility such as the lined trench, the surge pond, or the neutralization pond. The berms and the base of the buildings shall be lined with a minimum of 30 mil PVC, 40 mil HDPE or any other approved liner.
- 2. Brohm Mining shall notify the Department immediately upon scalent or coagulant spillage. This notification shall follow procedures set forth in the spill contingency plan.

This letter serves only to conditionally approve the technical revision to install storage buildings for anti-scalent and coagulant solutions. This letter in no way is to be construed as agreement to, or approval of, any future plans associated with the project. Approval of this technical revision does not in any way release the application from responsibility that the project will be an operable facility when construction is completed.



Brohm Mining may proceed with the work outlined in the approved technical revisions upon compliance with the above conditions.

Should you have any questions concerning this matter, please do not hesitate to contact this Office (Phone: (605) 773-4201).

Sincerely,

Rapud F. Builey, P.E.

Raymond F. Birchem, P.E.

Staff Engineer

Department of Water and Natural Resources

Phone: (605) 773-3754

MAS - 5 1369



Joe Foss Building 523 East Capitol Pierre, South Dakota 57501-3181

November 16, 1988

Mr. John Wilbanks Brohm Mining Corporation P.O. Box 485 Deadwood, SD 57732

Re: Technical Revision to modify the loading of the leach pad.

Dear Mr. Wilbanks:

Department review has been completed for the Technical Revision submitted October 5, 1988, concerning the leach pad loading modification to allow filling of voids between cells. This modification falls under Technical Revision Condition No. 14 of the April 21, 1988 Amendment to Mining Permit 439. Technical Revision No. 14 concerned modifying the gold recovery process within the process facility for maximum performance. As a result of this review, the conditional approval for the technical revision for the pad loading modification has been granted. This approval is contingent upon Brohm Mining complying with the following conditions:

1. Referring to the conditions placed on the April 21, 1988
Amendment to Mining Permit No. 439, and due to the fact that
leaching began with Cells #6 and #7, Condition B-4 under
Heap Neutralization shall be revised as follows:

During each seven-cell leaching cycle, one cell shall be subjected to the monitoring required under intensive treatment monitoring, (A-2) above. This monitoring will begin with heap Cell #1 following its second use, #2 after its third use, #3 after (its) interior and so on. Compliance for off-loading must be demonstrated in accordance with (A-3) above. If these intensive



monitoring procedures clearly indicate that the reliability of the operational monitoring schedule or parameters is inadequate, the Department may revise the operational monitoring schedule to correct deficiencies.

- 2. Brohm Mining shall allow adequate buffer between ore undergoing leaching, spent ore undergoing neutralization, and spent ore being off-loaded to prevent mixing of ore under leach, or unneutralized spent ore, with spent ore being off-loaded.
- 3. If a leach pad cell has or develops a leakage rate through the primary liner that, individually, causes an overall pad leakage rate of 300 gallons per acre per day or more (gpad), that cell, for subsequent ore loading, shall be isolated from the rest of the pad by leaving void spaces between the leaking cell and adjacent cells. A cell that has individually caused an overall pad primary liner leakage rate of 300 gpad or more shall continue to be isolated until it is repaired. This does not eliminate the need to comply with the response actions required under the action leakage rate schedule (i.e. any cell having a leakage rate that causes the overall pad leakage rate to exceed 300 GPAD is to be repaired following off-loading).
- 4. For each individual cell in compliance with approved neutralization standards, a cell shall only be off-loaded to a point on the primary liner as shown on the attached drawing and described as follows:

The toe of the slope of spent ore on the primary liner which has its crest at the point directly above the cell dividing berm.

Off-loading the cell to the cell dividing berm may cause spent ore from the next adjacent cell, which may not be in compliance, to be off-loaded. Off-loading shall not proceed beyond the above described point until the next adjacent cell is neutralized and is in compliance with approved standards. The estimated toe and crest of the slope shall be marked or flagged to prevent work crews from off-loading beyond this boundary.

This letter serves only to conditionally approve the technical revision to allow the leach pad loading modification. This letter in no way is to be construed as agreement to, or approval of, any future plans associated with the project. Approval of this technical revision does not in any way release the applicant from responsibility that the project will be an operable facility when construction is completed. Brohm Mining may proceed with the pad loading modification upon compliance with the above conditions and compliance order issued to Brohm on October 24, 1988.

Should you have any questions concerning this matter, please do not hesitate to contact this Office.

Sincerely,

Michael D. Cepak

Michael D Cept

Natural Resources Engineer

Exploration and Mining Program

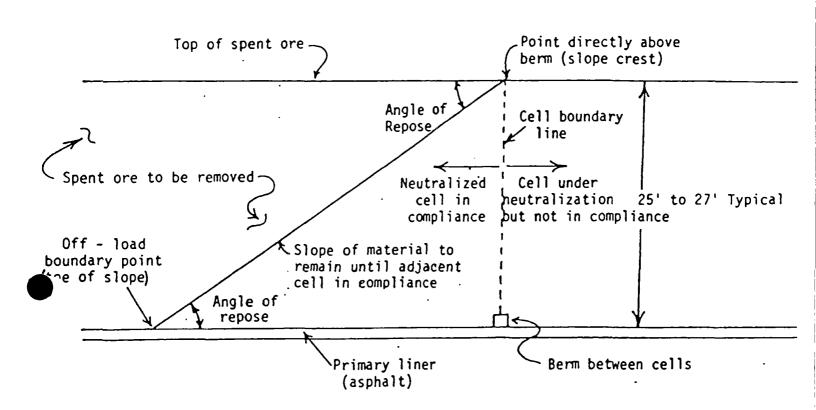
Telephone: (605) 773-4201

GENERALIZED CROSS SECTION OF BROHM LEACH PAD

SHOWING OFF-LOAD BOUNDARY POINT

NORTH

SOUT.



REFERENCE CONDITION 4, TECHNICAL REVISION FOR MODIFYING LOADING OF BROHM LEACH PAD

Department of Water & Natural Resources

Joe Foss Building 523 East Capitol Pierre, South Dakota 57501-3181

August 23, 1988

Mr. Rex Outzen
Brohm Mining Corporation
P.O. Box 485
Deadwood, SD 57732

Re: Technical Revisions to leave slash in waste disposal area, to install an antiscalant tank, and to operate two dewatering and monitoring wells near the surge pond.

Dear Mr. Outzen:

Departmental review of the technical revision submitted August 3, 1988, regarding the three above mentioned revisions, has been completed. As a result of this review, the conditional approval for leaving slash material in the waste disposal areas and for the solution heater antiscalant tank and containment, has been granted. This approval is contingent on Brohm Mining complying with the following conditions:

Slash in Waste Disposal Areas

- 1. Brohm Mining shall remove all salvageable topsoil from the waste disposal area.
- 2. All marketable timber shall be removed from the waste disposal areas. All non-marketable timber exceeding six inches in diameter shall also be removed and disposed of properly.
- 3. During final reclamation and regrading of the waste disposal areas all trees and topsoil shall be removed from the area that will be covered with waste outside of the toe of the end dumped area.
- 4. Slash to be left shall be laid flat prior to covering with waste.



Antiscalant Tank

1. Brohm Mining shall submit to the Department evidence by October 1, 1988 that the antiscalant acid is compatible with the HDPE liner material.

As discussed with J. Wilbanks over the telephone with M. Cepak, on August 8, 1988 additional information is required prior to approval of the dewatering wells. Such information as well design, depth of the wells, depth of water, fate of water pumped from the wells, etc. was required. The Department received this information on August 18, 1988 and the processing of this technical revision is continuing.

This letter serves only the conditionally approve the technical revision to leave slash material in the waste disposal areas and for the solution heater antiscalent tank and containment. This letter in no way is to be construed as agreement to, or approval of, any future plans associated with the project. Approval of this technical revision does not in any way release the applicant from responsibility that the project will be an operable facility when construction is completed. Brohm Mining may proceed with the work outlined in the approved technical revisions upon compliance with the above conditions.

Should you have any questions concerning this matter, please do not hesitate to contact this Office (Phone: (605) 773-4201).

Sincerely,

Raymond F. Birchem, P.E.

Raymon F. Berela, P.E.

Staff Engineer

Department of Water and Natural Resources

Phone: (605) 773-3754

B81702MC.SM

Department of Water & Natural Resources

Joe Foss Building 523 East Capitol Pierre, South Dakota 57501-3181

June 2, 1988

Mr. Rex Outzen
Brohm Mining Corporation
P.O. Box 485
Deadwood, SD 57732

Re: Technical Revision to Diatomaceous Earth Pond and to Leach Pad.

Dear Mr. Outzen:

Departmental review of the technical revision submitted May 18, 1988 with supplemental information submitted May 18, 1988, specifically regarding the expansion of the diatomaceous earth pond and leach pad, has been completed. As a result of this review, the conditional approval for the technical revision has been granted. This approval is contingent on Brohm Mining complying with the following condition:

1. Construction of the expansion areas of the diatomaceous earth pond and leach pad shall follow the plans and specifications, conditionally approved April 18, 1988 and May 25, 1988, for these facilities. Construction of the expansion areas shall also comply with conditions placed on the approval of the plans and specifications for these facilities.

This letter serves only to conditionally approve the technical revision to expand the diatomaceous earth pond and leach pad. This letter in no way is to be construed as agreement to or approval of any future plans associated with the project. Approval of this technical revision does not in any way release the applicant from responsibility that the project will be an operable facility when construction is completed. Brohm may begin construction of the approved facilities contingent upon compliance with the above condition.



Should you have any questions concerning this matter, please do not hesitate to contact this Office (Phone: (605) 773-4201).

Sincerely,

Raymond T. Franken, 1'c

Raymond F. Birchem, P.E. Staff Engineer

Department of Water and Natural Resources

Phone: (605) 773-3754

B60103MC.SM

